

Non-Marked version of the Claims

1 – 28 (Canceled)

32. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity [22] and cardiac sounds [20], wherein said identifying comprises:
 1. collecting at least said cardiac sounds [20] by the means of at least one microphone;
 2. separating said cardiac sounds [20] apart from the sounds related to said respiratory activity [22], by the means of a signal conditioning module [28];
- temporally segmenting said respiratory and said cardiac sounds to express the segments of physiological rhythmicity, by the means of a feature extraction module [30];
- extracting stable features of the heart sounds with respect to their timing in the respiratory cycle, thus providing synchronized stable features for diminishing stochastic variability, by the means of a timing analysis module [32];
- averaging the features of segments of heart sounds with respect to the corresponding respiratory cycle; wherein said averaging resulting averages in which the temporal variability of said segments is preserved;
- determining the extent of temporal variability in groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline, by the means of a temporal segmentation and feature parameter extraction module [34].

33. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient as in claim 29, said method used for

synchronizing a heartbeat synchronized system, said analyzing based on the information derived from the group of items consisting of: heart sounds amplitude, interval between them, amplitude and frequency content, and any combination thereof.

34. (Previously Presented) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity [22] and cardiac sounds [20], wherein said identifying comprises:
 1. collecting at least said cardiac sounds [20] by the means of at least one microphone;
 2. separating said cardiac sounds [20] apart from the sounds related to said respiratory activity [22], by the means of a signal conditioning module [28];
- temporally segmenting respiratory sounds and cardiac electrocardiographic signals to express the segments of physiological rhythmicity, by the means of a feature extraction module [30];
- extracting stable features of the heart sounds with respect to their timing in the electrocardiographic signals, thus providing synchronized stable features for diminishing stochastic variability, by the means of a timing analysis module [32];
- averaging the features of segments of heart sounds with respect to the corresponding electrocardiographic signals whilst preserving the temporal variability of said segments; wherein said averaging resulting averages in which the temporal variability of said segments is preserved;
- determining the extent of temporal variability of groups of synchronized stable sound features, and detecting change over time of at least one feature in a synchronized stable sound relative to a baseline, by the means of a temporal segmentation and feature parameter extraction module [34].